

Protecting Your Portfolio Through A Shift In Volatility

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Options

- For the sake of simplicity, the examples that follow do not take into consideration commissions and other transaction fees, tax considerations, or margin requirements, which are factors that may significantly affect the economic consequences of a given strategy. An investor should review transaction costs, margin requirements and tax considerations with a broker and tax advisor before entering into any options strategy.
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Index

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Agenda

Nasdaq-100 Index

- Description
- Current Market State Analysis

Portfolio Hedging with Options

- Nasdaq-100 Index Options
- Hedging Strategies

Q&A

Innovation and Disruption

Apple | Amazon | Splunk | Intel | Atlassian

- Technology continues to evolve and become more efficient each day. Creating products or services which continue to be in demand is essential to surviving in today's competitive world.
- Technology is the driver of the economic engine. Whether it is advancements in transportation, communication, media, medicine and investments – the driver of growth and innovation is the power of technology allowing for advancements in data analysis, testing and decisions.
- The technology industrials are the new drivers of the industry. Businesses around the world will continue to demand and use these highly efficient products to keep pace with their competitors.
- And now it is technology that is keeping the new economic ecosystem safe

Nasdaq-100 Index: Overview

Contains the household names leading the new economy forward

- Technology stocks have evolved from creating new and niche consumer products to a group of companies upon which every industry and sector have become dependent. From day-to-day tasks to social interaction, each has an important influence on everyday life.
- GE, Chicago Gas Company, American Sugar Company, and the other original Dow Industrials helped spur the economic growth of the US economy in 1896.
- Today, Apple, Amazon, Intel, and Microsoft have become global leaders in the technology sector by helping create products which continue to be in high demand from consumers. From computers to cell phones, all of these products will continue to become more advanced in the future.
- From a social perspective, Facebook has become a quick and efficient way of interacting with friends around the globe. Starbucks also continues to improve its efficiency to customers by utilizing advanced technology.



Technology and Life

Report 1: Percentage of U.S. Equity Funds Outperformed by Benchmarks

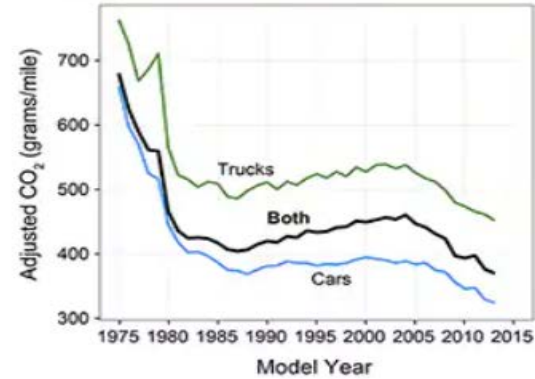
FUND CATEGORY	COMPARISON INDEX	1-YEAR (%)	3-YEAR (%)	5-YEAR (%)	10-YEAR (%)	15-YEAR (%)
All Domestic Funds	S&P Composite 1500	63.43	83.40	86.72	86.65	83.74
All Large-Cap Funds	S&P 500	63.08	80.56	84.23	89.51	92.33
All Mid-Cap Funds	S&P MidCap 400	44.41	86.34	85.06	96.48	94.81
All Small-Cap Funds	S&P SmallCap 600	47.70	88.83	91.17	95.71	95.73

U.S. oil production soars

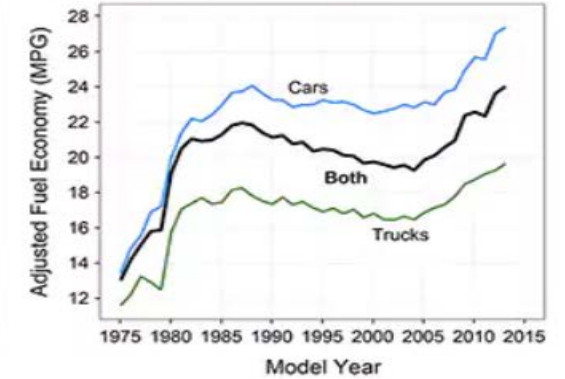


Source: EIA daily oil production statistics | Source: The internet, S&P Global; cancer.gov; eia.gov; epa.gov

Adjusted CO₂ Emissions for MY 1975-2013¹

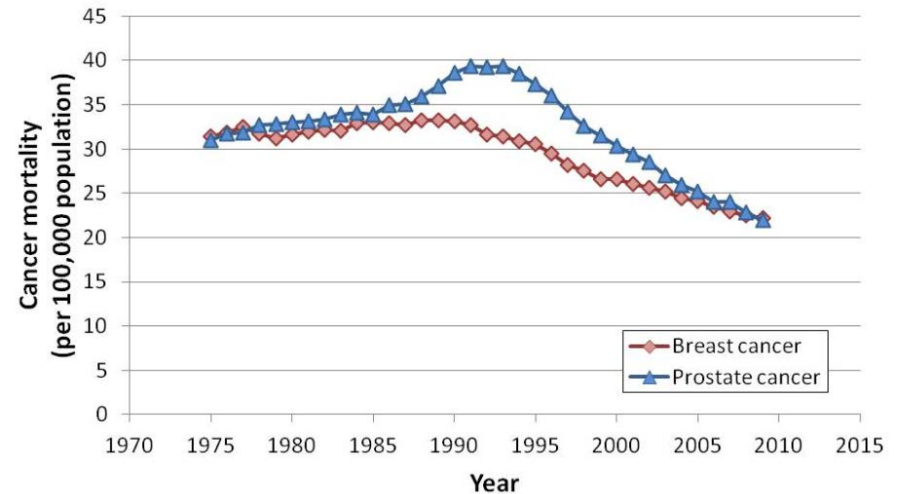


Adjusted Fuel Economy for MY 1975-2013¹



¹ Adjusted CO₂ and fuel economy values reflect real world estimates and are not comparable to automaker standards compliance levels. Adjusted CO₂ values are, on average, about 25% higher than the unadjusted laboratory CO₂ values that form the starting point for GHG standards compliance, and adjusted fuel economy values are about 20% lower, on average, than unadjusted fuel economy values.

Change in mortality from cancer over time



Nasdaq-100

The Benchmark of the 21st
Century Industrials

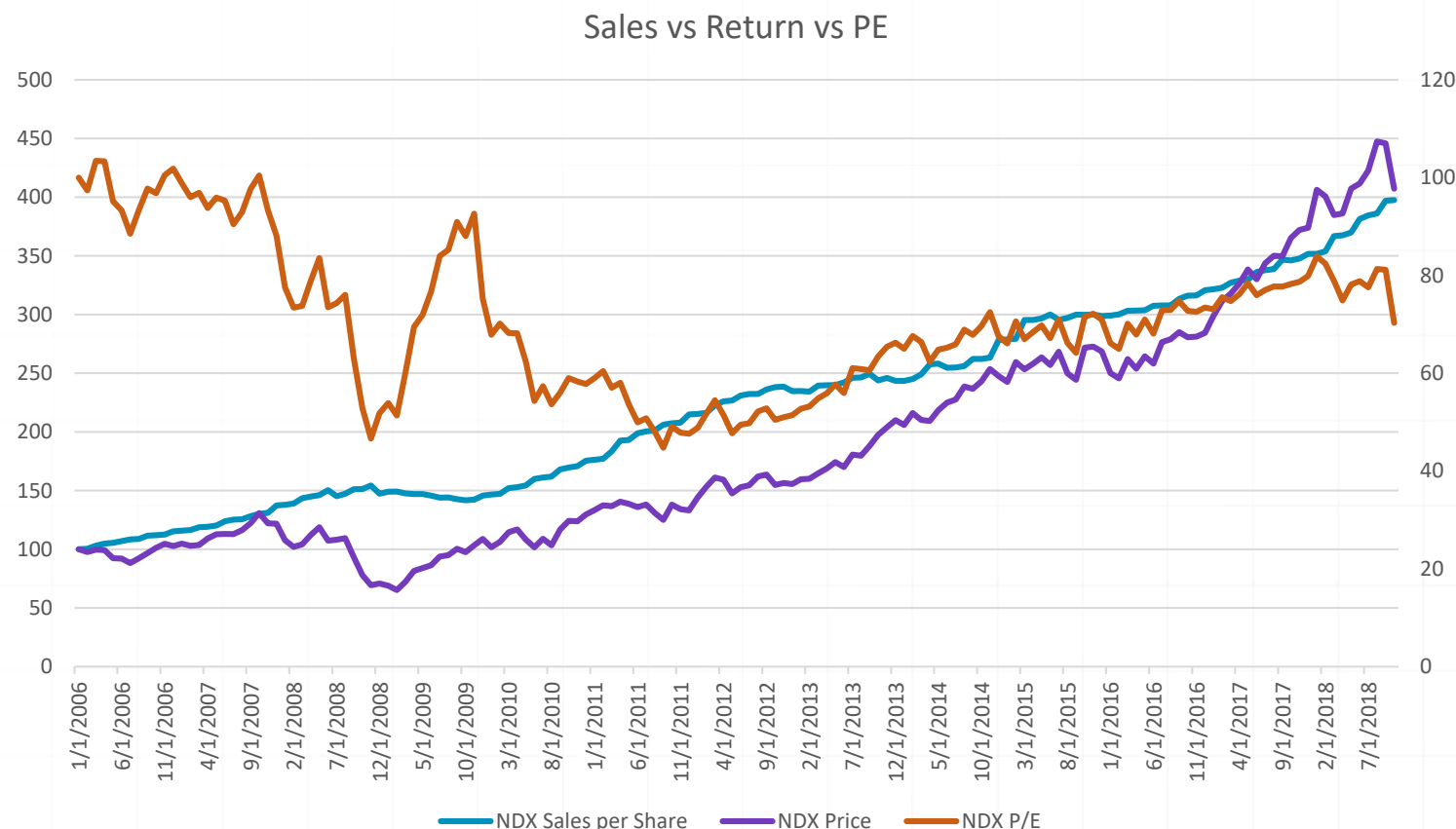
Nasdaq-100 Index: History

- The Nasdaq-100[®] (NDX) is comprised of the 100 largest, non-financial companies listed on The Nasdaq Stock Market[®]
- Launched on January 31, 1985
- Rebalanced to modified market cap index on December 21, 1998
- Special Rebalance effective May 2, 2011



Market Performance and Technology

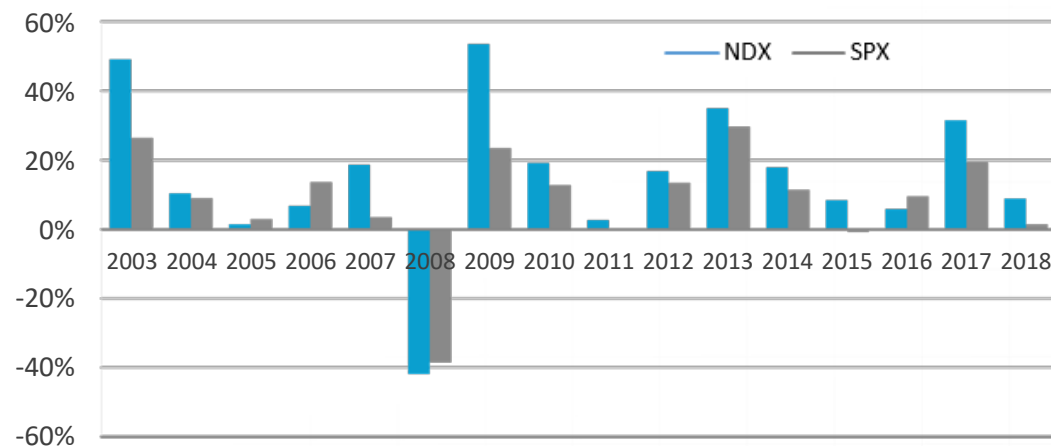
- Recent market declines from historical highs have been seen in past several years
- Fundamental story drives recovery rewarding the growth of the companies
- Sales: +297%
Price: +307%
Valuation: - 30%



Source: Bloomberg

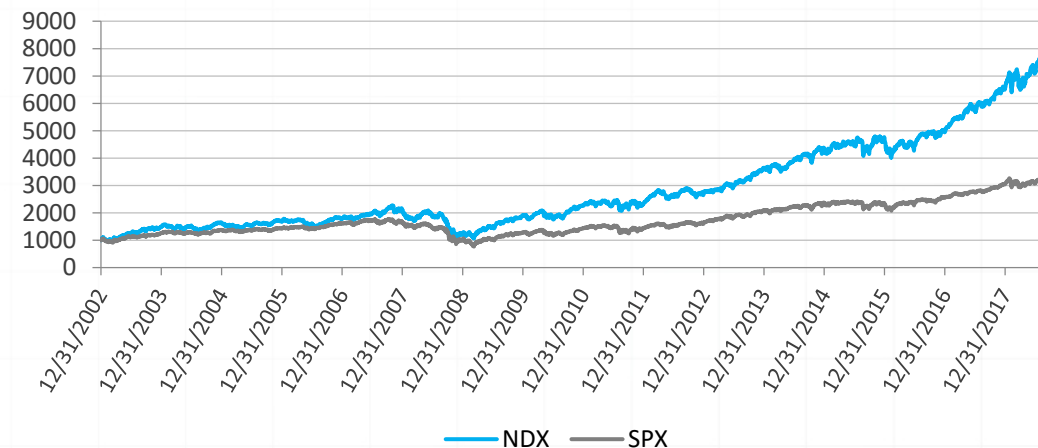
Nasdaq-100 Index: Performance

INDEX ANNUAL RETURNS – 2018 DATA AS OF END OF OCTOBER



- NDX has been marked by both the growth and maturation of the companies in the index over the years. Through the financial crisis, in the subsequent market rebound and the following bull market, NDX's P/E has stabilized. NDX's P/E as of October 31, 2018 was 22.9 (through 10/31/2018)—slightly higher than SPX's 18.58.
- There were substantial increases in market cap along with earnings in NDX from year-end 2012 to October 31, 2018 (from \$3.1T to \$8T in market cap and from \$137B in earnings to \$319.6B).

INDEX PERFORMANCE FROM 2003 TO OCTOBER 31, 2018



- NDX realized volatilities for 2014, 2015, 2016, 2017 and 2018 were 14.0%, 17.9%, 16.1%, 10.28% and 20.37% respectively.
- NDX yield increased most years between 2003 and 2017, and finished October 2018 with a yield of 0.83%.

The NASDAQ-100 Index's price return performance versus the S&P 500 on both an annual basis (left) and cumulative basis (above)

Source: Nasdaq, Bloomberg. Data as of 10/31/2018.

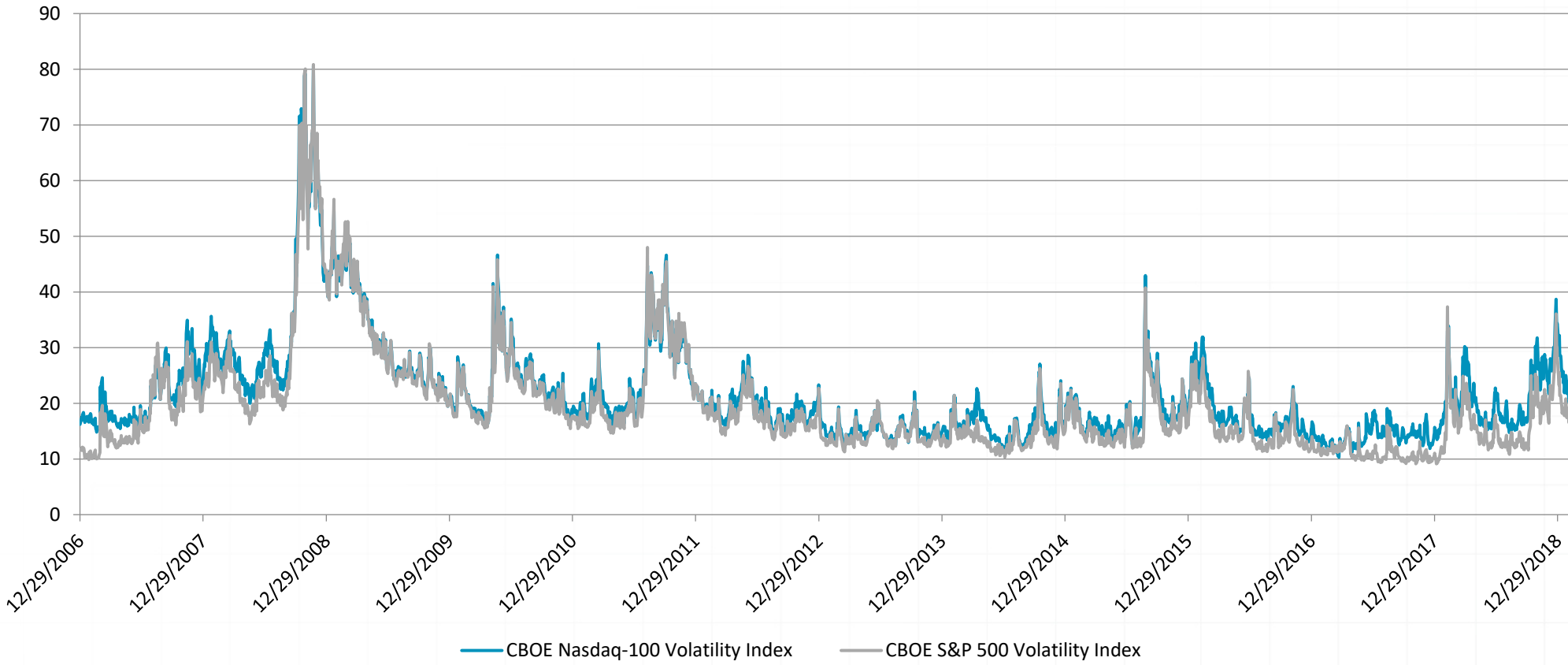
Performance Data (Total Return)

Year	Calendar Year Return		Correlation	Calendar Year Volatility	
	Nasdaq-100	S&P 500	NDX + SPX	Nasdaq-100	S&P 500
2007	19.24%	5.49%	0.890	18.68%	15.99%
2008	-41.57%	-37.00%	0.945	42.22%	40.89%
2009	54.61%	26.46%	0.935	26.47%	27.25%
2010	20.14%	15.06%	0.949	19.48%	18.06%
2011	3.66%	2.11%	0.948	23.75%	23.24%
2012	18.35%	16.00%	0.920	15.44%	12.74%
2013	36.92%	32.39%	0.901	12.49%	11.16%
2014	19.40%	13.69%	0.924	14.06%	11.36%
2015	9.75%	1.38%	0.947	17.85%	15.50%
2016	7.27%	11.96%	0.916	16.17%	13.11%
2017	32.99%	21.83%	0.801	10.32%	6.69%
2018	0.04%	-4.38%	0.949	22.70%	17.04%

Source: Nasdaq, Bloomberg. Data as of 12/31/2018.

Historical Volatility

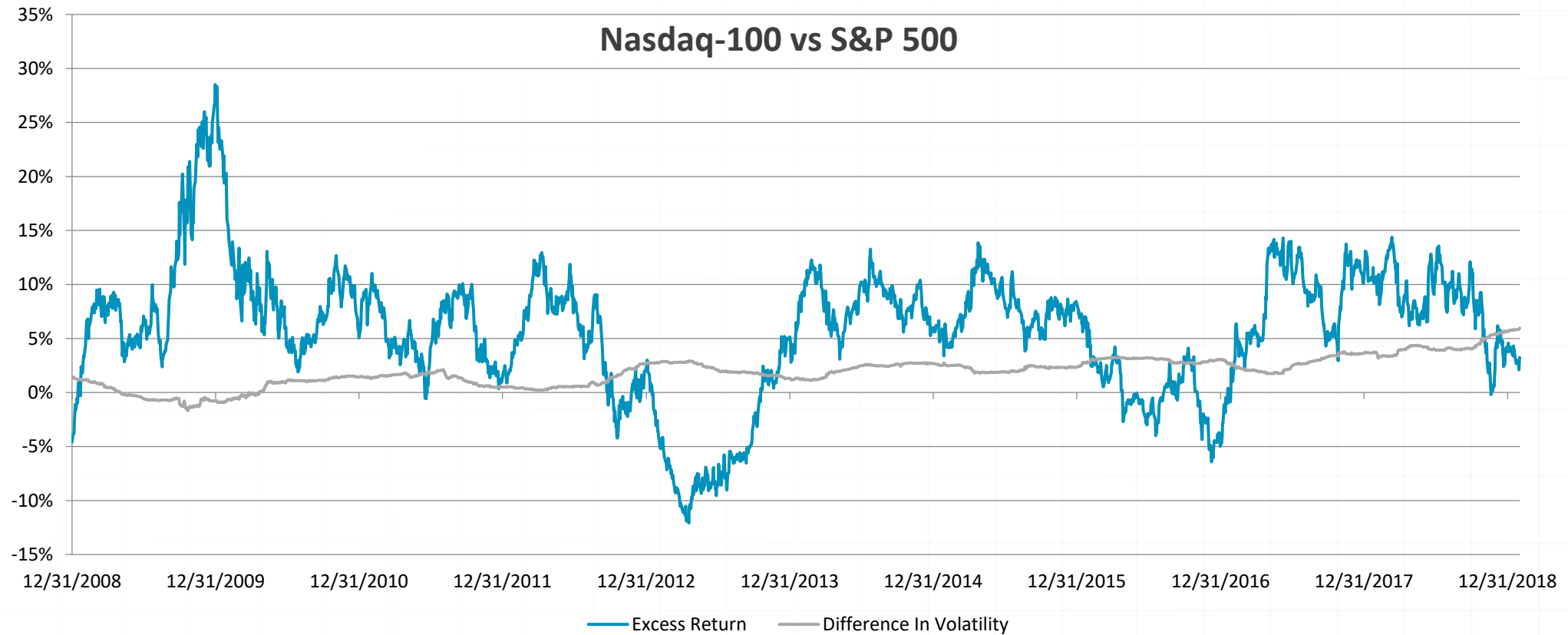
- Both NDX-100 and SPX 500 have very similar volatility over last 10+ years



Source: Nasdaq, Bloomberg. Data as of 1/31/2019.

1-Year Excess Return vs. Volatility

From December 2008 through January 2019



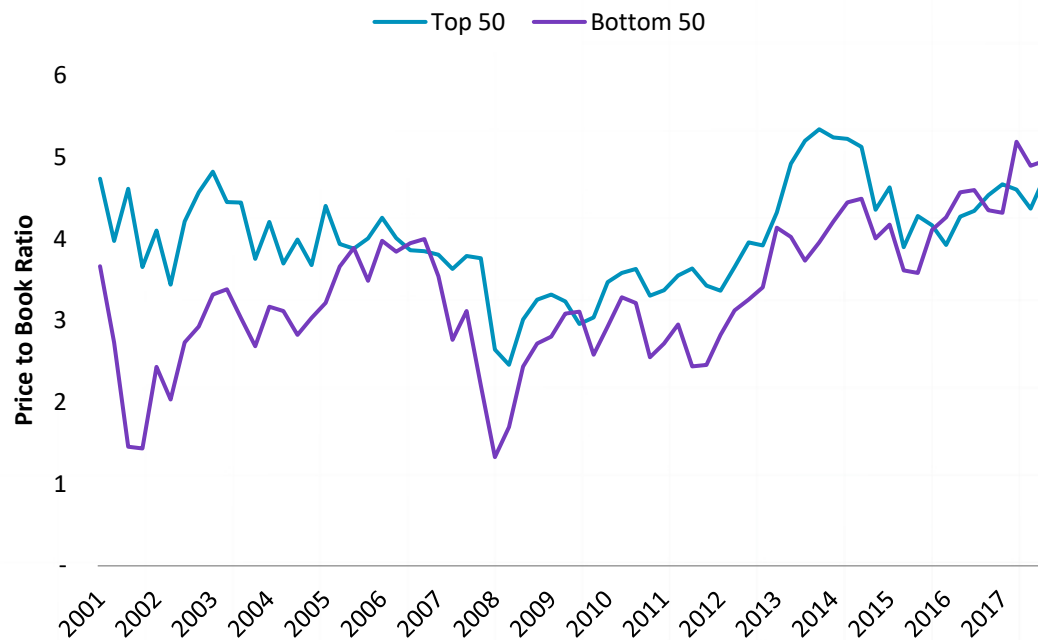
Source: Nasdaq, Bloomberg. Data as of 1/31/2019.

The 100 That Make the Index

Top 50 vs Bottom 50

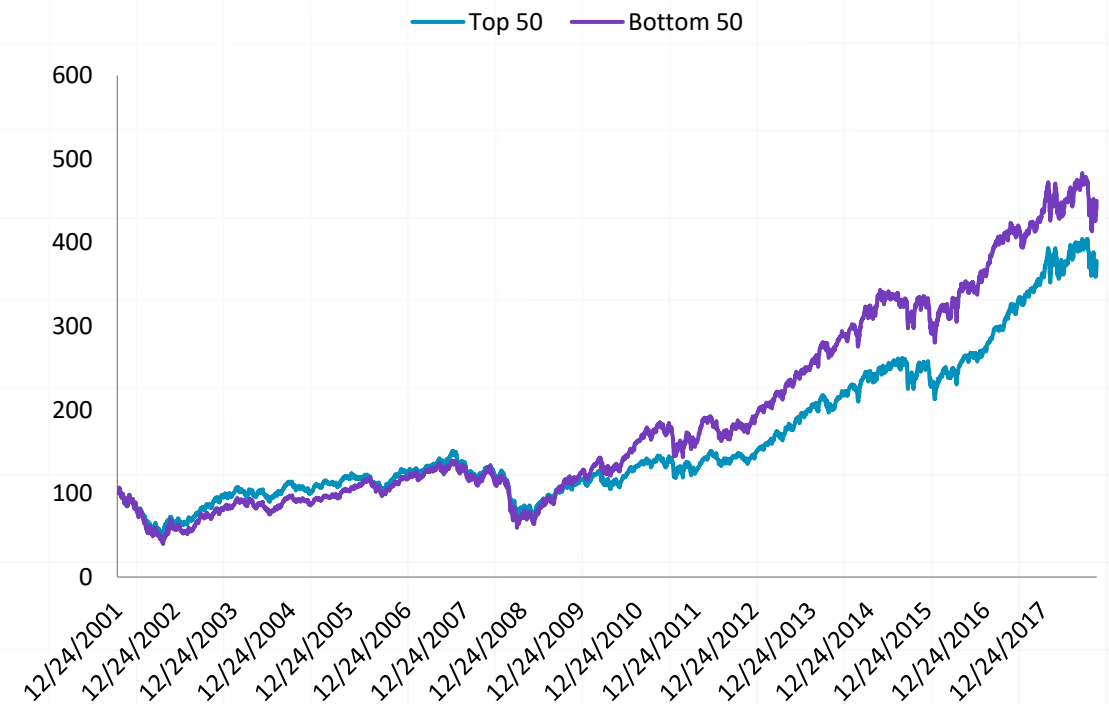
The top positions in market capitalization weighted indexes are often heavily focused on larger holdings while putting less emphasis on smaller holdings. We can visualize it with a sample test. Let's equally divide the stocks in the Nasdaq-100 into two segments based on market capitalization: the Top 50 and the Bottom 50. The average Price to Book ratio chart shows a consistent bias toward the Top 50 - they are highly valued (Figure 1). This means that great values exist in the bottom 50 of the Nasdaq-100. Our back-tests also verified that the equally weighted bottom 50 portfolio has outperformed the top 50 portfolio since 2001 (Figure 2).

Figure 1: Price to Book Ratios within Nasdaq-100



Source: Nasdaq, Bloomberg. Data as of 10/31/2018.

Figure 2: The Bottom 50 of Nasdaq-100 is outperforming



The Decade of the Nasdaq-100

The underlying story for the rise in the Nasdaq-100 is that the U.S.'s economic growth is shifting from the traditional industries (Basic Materials and Oil & Gas) to the newer sectors (Health Care and Technology) (Figures 3 & 4).

Figure 3: 10-Year Sales Growth Across Industries in the Nasdaq US Large Mid Benchmark as of October 31, 2018

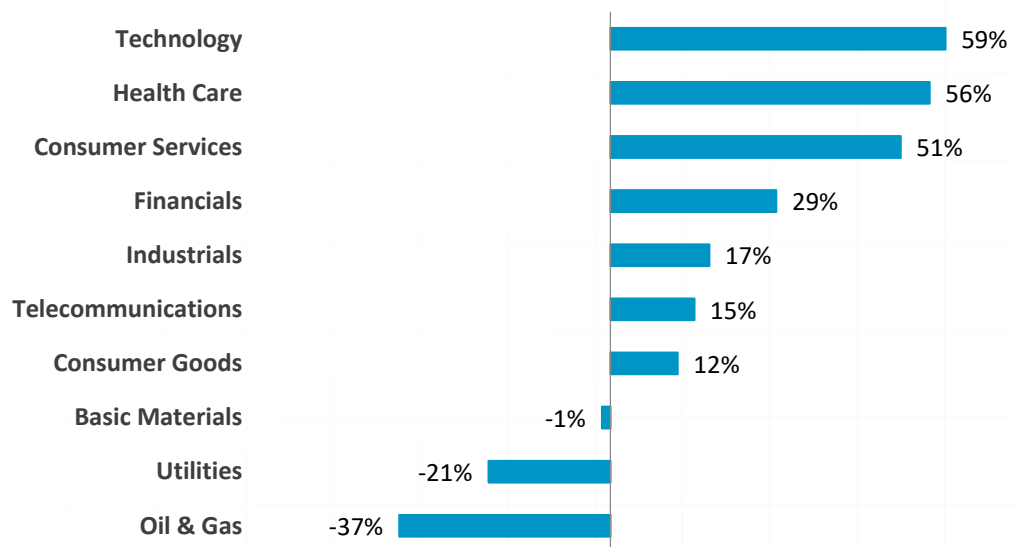
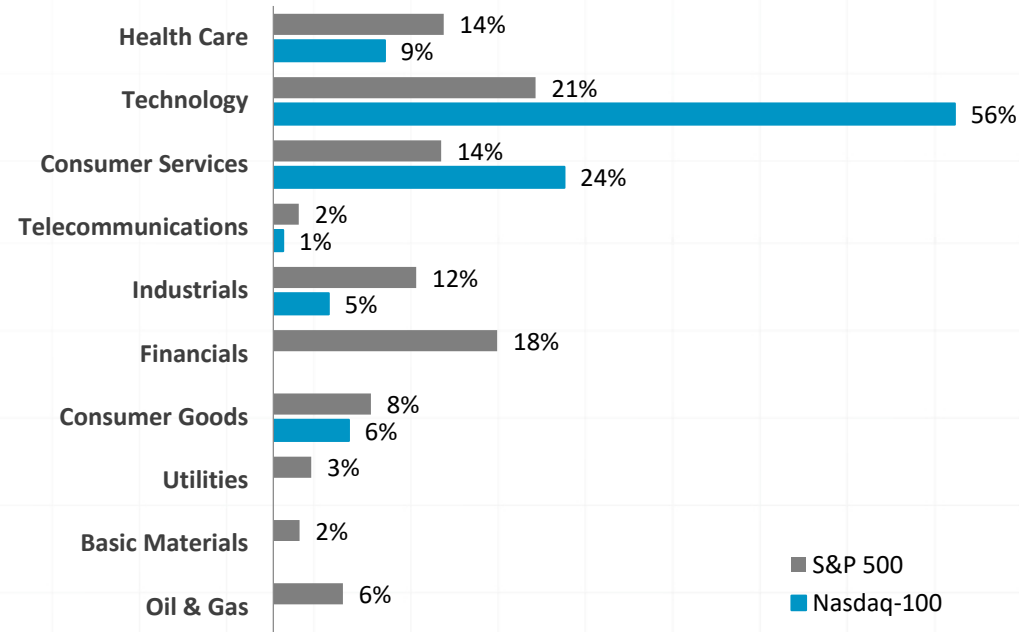


Figure 4: Industry Breakdown in Nasdaq-100 and S&P 500 as of October 31, 2018



Source: Nasdaq, Bloomberg. Data as of 10/31/2018.

Nasdaq-100 Index: Components

Top Performers- YTD as of November 27, 2018

Ticker	Name	2018 YTD Return	11/27/2018 Weight
ILMN	ILLUMINA, INC.	47%	0.61%
ORLY	O'REILLY AUTOMOTIVE	47%	0.37%
FOX	21ST CENTRY FOX B CM	43%	0.51%
NFLX	NETFLIX, INC.	39%	1.51%
WDAY	WORKDAY, INC.	36%	0.26%
ISRG	INTUITIVE SURG, INC.	36%	0.73%
AMZN	AMAZON.COM INC	35%	10.00%
ADSK	AUTODESK INC	34%	0.40%
ESRX	EXPRESS SCRIPTS	33%	0.73%
ULTA	ULTA BEAUTY	33%	0.23%

Highest 3Q 2018 YOY Growth in Earnings

Ticker	Name	3Q 2018 Earnings Growth
AVGO	BROADCOM INC	2275%
CHTR	CHARTER COMMUN-A	1551%
AMZN	AMAZON.COM INC	361%
CSX	CSX CORP	257%
VRTX	VERTEX PHARM	230%
NFLX	NETFLIX INC	182%
SHPG	SHIRE PLC-ADR	179%
MU	MICRON TECH	172%
KHC	KRAFT HEINZ CO/T	164%
TMUS	T-MOBILE US INC	129%

Additional select, high performing components not in the top 10 include: Apple, PayPal and Tesla

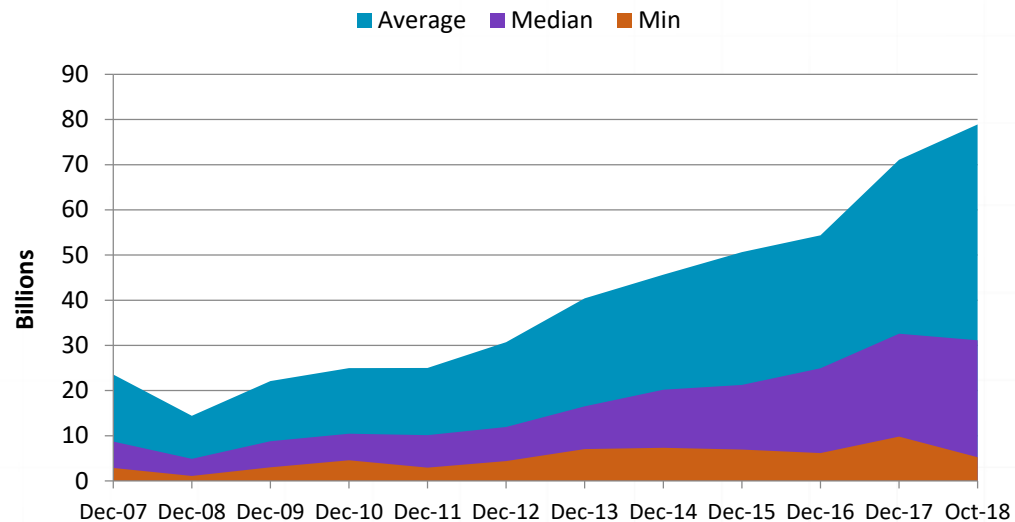
Source: Nasdaq, Bloomberg. Data as of 11/27/2018.

Nasdaq-100 Index: Components

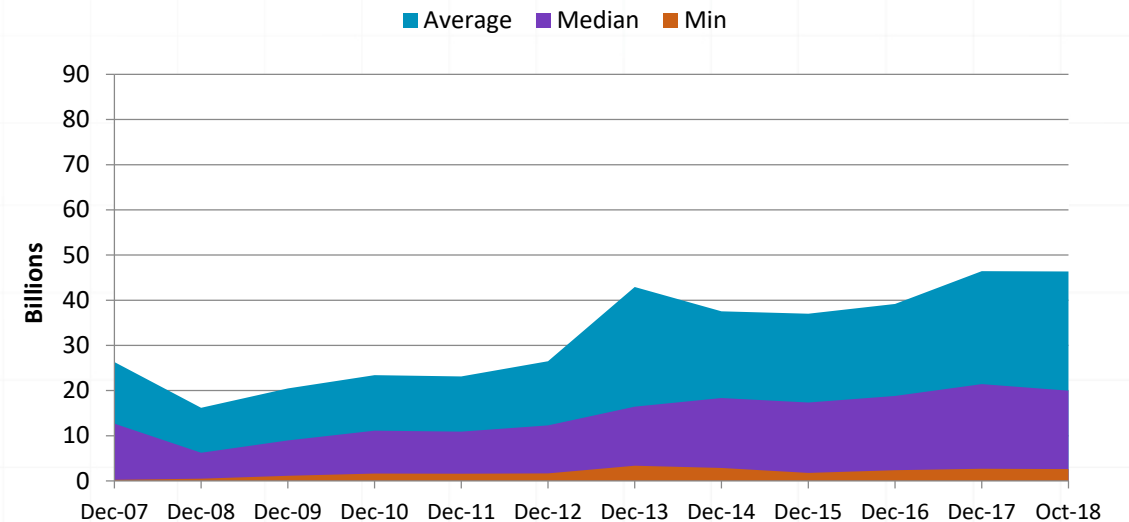
Average, median and minimum market caps of the NASDAQ-100 and the S&P 500

- All figures dropped during the financial crisis and have rebounded since.
- Nine of the last ten years the average market cap has been higher in NDX than SPX including 2018 – as of October 31 (NDX: \$78.92, SPX: \$46.36B).
- The median market cap has been higher for NDX than SPX in each of the last five years — in 2018 the medians were \$31.11B for NDX and \$19.98B for SPX. Despite any large companies, the market cap of NDX tends to be truer to large cap than SPX.
- The smallest company in NDX (2018: \$5.2B) has been larger than the smallest company in SPX (2018: \$2.6B) for the last ten years.

NDX: MARKET CAP



SPX: MARKET CAP



Source: Nasdaq, Bloomberg. Data as of 10/31/2018.

Nasdaq-100 by the Sectors

Nasdaq-100 Index: Sectors

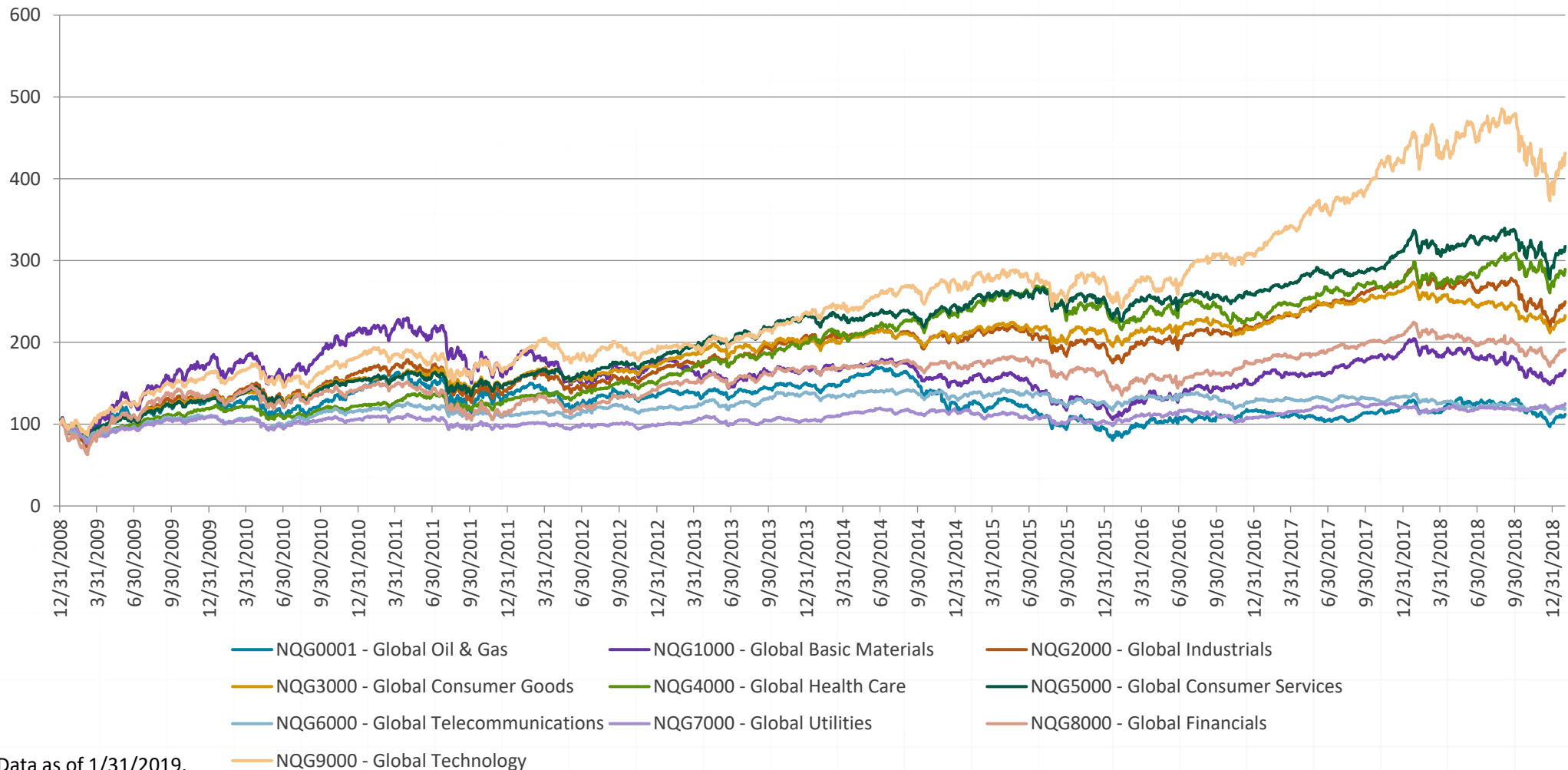
Sector Breakdown

- While heavy in technology, consumer industries and healthcare make up a comparable weight
- Consumer Services contains companies like Amazon, Starbucks, Netflix, Sirius, Costco and Viacom

Industry	Weight	Contributed Return	Pure Return	Benchmark return
Technology	55.96%	-0.68%	-1.95%	-1.74%
Consumer Services	24.36%	1.48%	7.27%	0.13%
Health Care	9.24%	-0.15%	-1.29%	4.46%
Consumer Goods	5.09%	-0.91%	-13.64%	-15.64%
Industrials	4.48%	0.37%	8.29%	-12.71%
Telecommunications	0.82%	-0.08%	-6.93%	-11.36%
Utilities	0.04%	-0.01%	-2.77%	1.48%
Basic Materials	0.00%	0.00%	0.00%	-20.09%
Oil & Gas	0.00%	0.00%	0.00%	-21.59%
Financials	0.00%	0.00%	0.00%	-11.52%

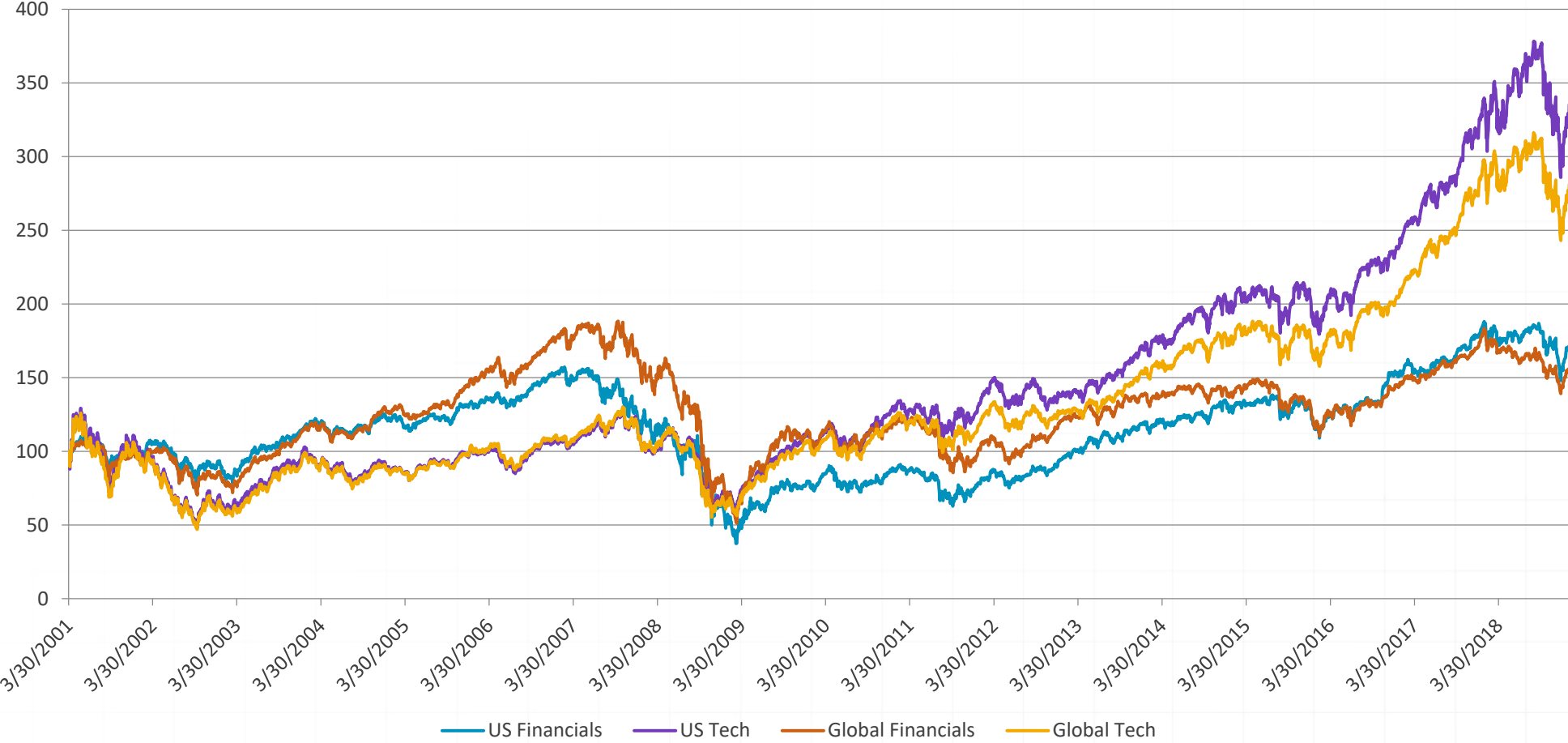
Source: Nasdaq, Bloomberg. Data as of 12/31/2018.

Sector Exposure Matters



Source: Nasdaq. Data as of 1/31/2019.

Technology or Financials



Source: Nasdaq. Data as of 1/31/2019.

Industries and Dividends

- Industry exposure, when pursuing dividend growth, is extremely important
- Technology and Health Care, two industries dominated by Nasdaq-100 companies, have had tremendous dividend growth, and are poised for continued growth

Cumulative Dividend Growth Since 2008		
	INDUSTRY	RETURN
1	Technology	240.52%
2	Health Care	51.73%
3	Telecommunications	34.85%
4	Oil & Gas	26.93%
5	Utilities	22.78%
6	Industrials	14.38%
7	Financials	13.56%
8	Consumer Services	-0.20%
9	Basic Materials	-24.55%
10	Consumer Goods	-62.70%

Source: Nasdaq. Data as of 10/31/2018.

The Fundamentals

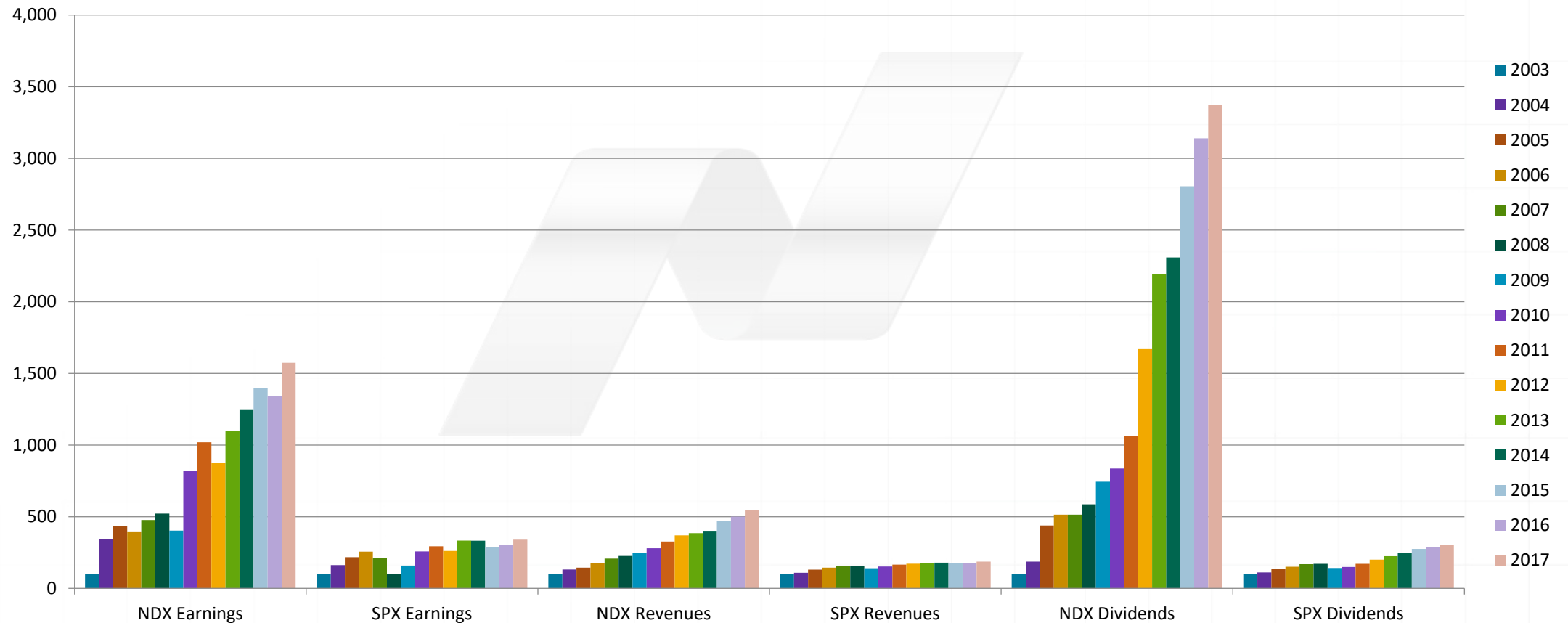
Nasdaq-100 Index: Fundamental Data

- The fundamental data behind the NASDAQ-100 has drastically improved over the past decade despite a volatile economy and the greatest financial market collapse since the Great Depression.
- Earnings, the most basic number to value a company, have skyrocketed, showing maturation of the companies as they increase revenues but reduce costs. Costs have been controlled, shares were bought back, dividends have increased and P/E has contracted.
- Since 2003, NDX has had a Compound Annual Growth Rate (CAGR) of:
 - + 24% in earning
 - + 14% in revenue
 - + 20% in dividend value
 - - 11% in P/E
- The shift in fundamentals of the NASDAQ-100 has resulted in significant outperformance over other US large cap indexes.



Nasdaq-100 Index: Fundamentals over time

NDX VS SPX FUNDAMENTALS



Source: Nasdaq, Bloomberg. Data as of 12/31/2017.

Nasdaq 100 Index Options

Poll Question

Roughly what percent of your portfolio is technology weighted?

- A. 0% - 25%
- B. 25% - 50%
- C. 50% - 75%
- D. 75%- 100%

How To Look At Your Portfolio

- While weighing the components of your portfolio, you may notice a return profile resembling that of an index
- Portfolios with a broad based exposure in companies focused on innovation tend to have a strong correlation with our Nasdaq 100 Index Products
- Options can be used to minimize risk and protect the value of your portfolio

Nasdaq-100 Index Options Products

NDX

- *Nasdaq's flagship index options product*
- Trading Symbol: NDX
- Expiration
 - Monthly AM Settlement (NDX)
 - Weekly PM Settlement (NDXP)

NQX

- *1/5 notional value of the Nasdaq 100*
- Trading Symbol: NQX
- Expiration
 - Monthly and Weekly PM Settlement (NQX)

Benefits of NDX Options for Portfolio Hedging

Cash Settlement

- Delivery of cash rather than underlying stock
- No risk of forced delivery

European Style Expiration

- Contracts can only be exercised at expiration
- No risk of early exercise/assignment

Easy Profit/Loss Calculation

- One index point equals \$100
- Simple profit/loss

Tax Advantages

- Favorable capital gains tax treatment- 60% long term/40% short term*

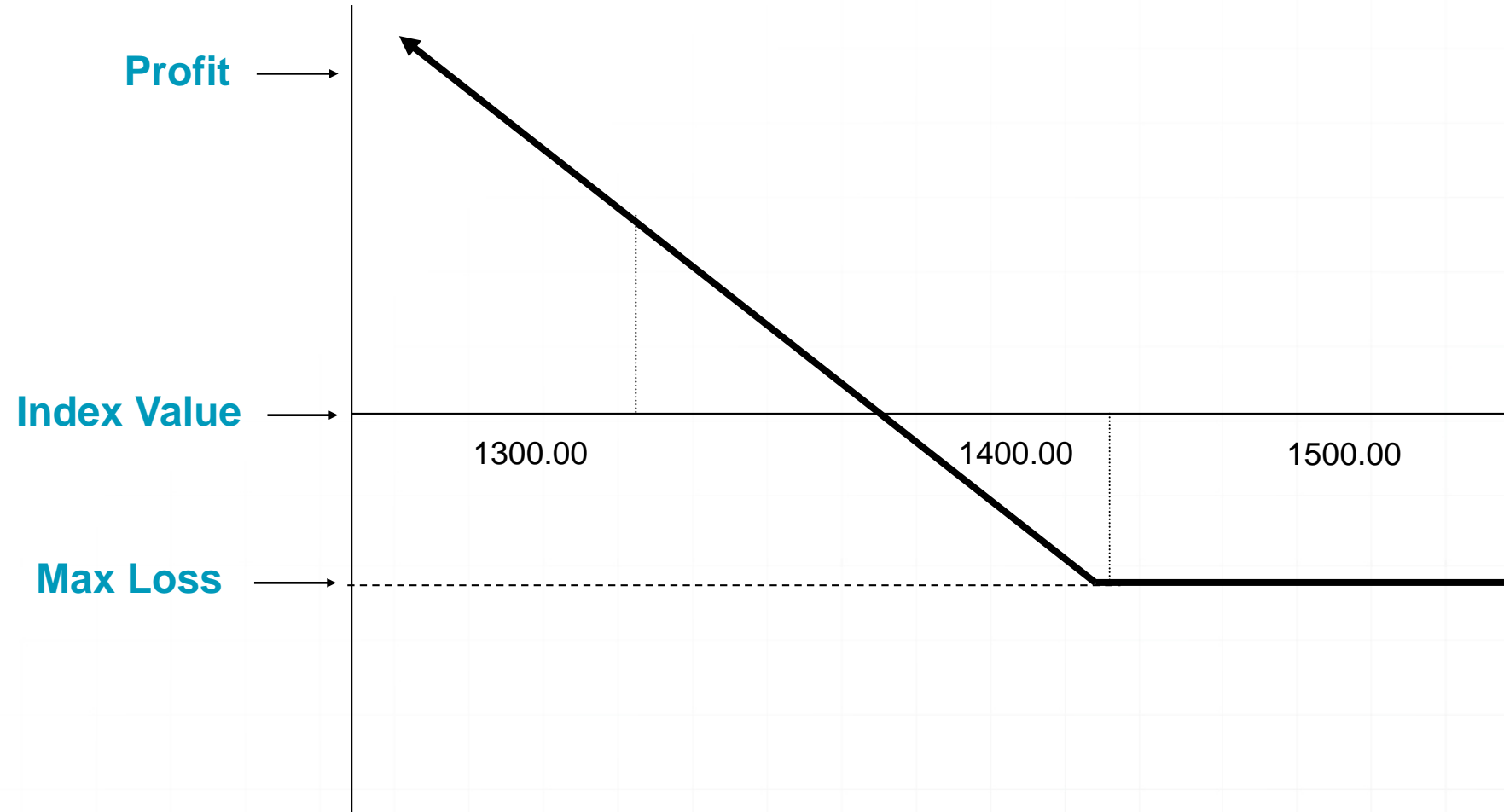


NDX Portfolio Strategies

Buying Downside Puts

- Different types of downside puts have different uses
 - Far out of the money (low delta)
 - Near out of the money (mid delta)
 - In the money (high delta)
- Investors can use their own judgement to prepare for market losses and systematic events
 - Choice of when, and to what extent, their portfolio is protected
- Profit
 - Max profit is equal to the strike price minus the premium paid
- Cost
 - Buying downside puts will still cost a premium, but that initial premium paid is your maximum loss possible
 - There are ways to offset these premium costs

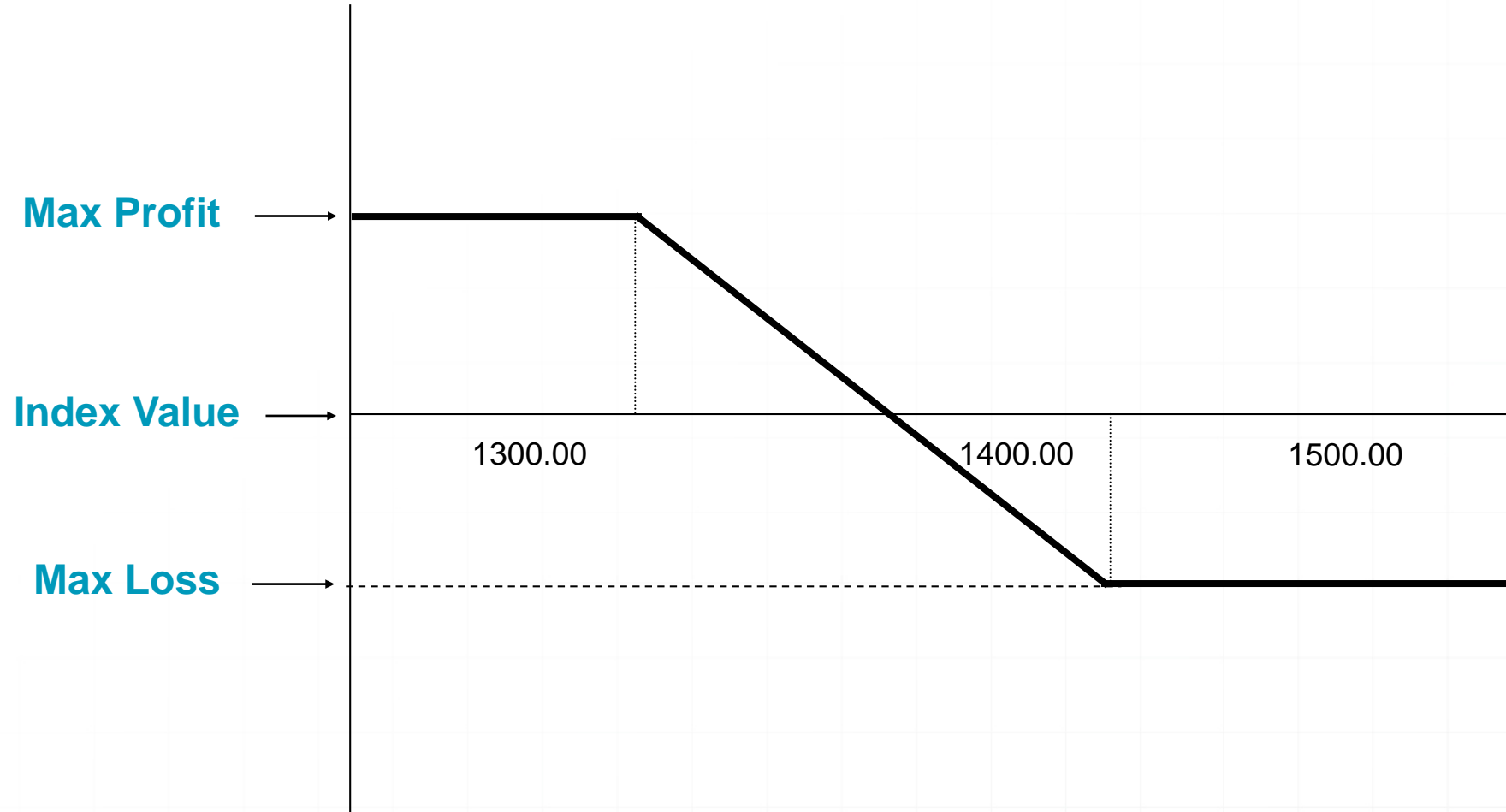
Buying Downside NQX Puts



Selling Upside Call Spreads

- Selling a call spread will generate income by collecting the premium paid for the spread
- Benefits
 - Max profit is the premium collected from selling the spread
- Risks
 - Max loss is the difference between the two strike prices, minus the premium collected from the spread
- This strategy can be employed to offset costs associated with buying a downside put

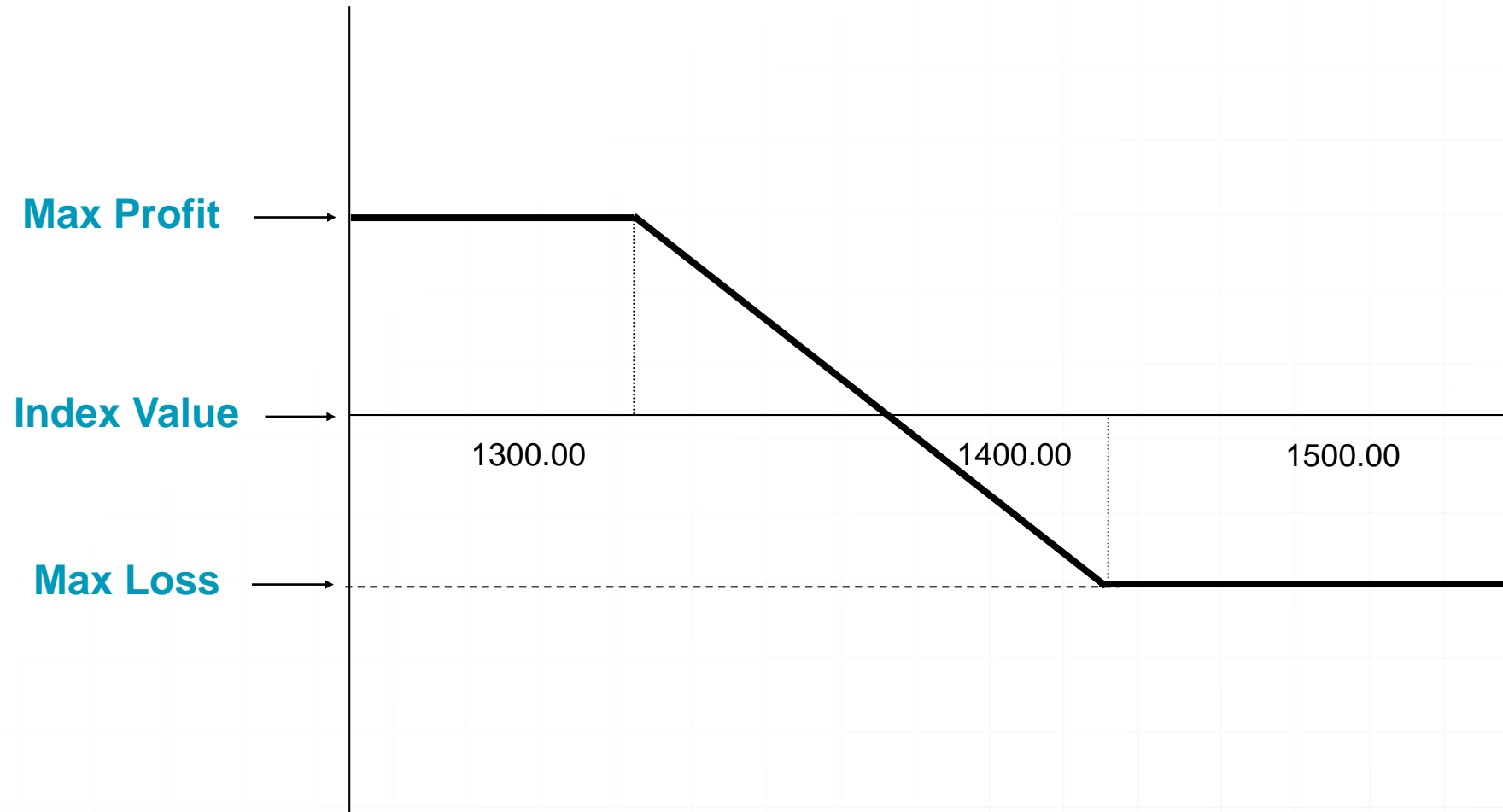
Selling Upside NQX Call Spreads



Buying Downside Put Spreads

- This strategy involves purchasing put options at a specific strike price, while also selling the same number of puts (same expiration date) at a lower strike price
- Benefits
 - Max profit is the difference between the two strike prices, minus the net cost of the spread
- Drawbacks
 - This strategy is an impure absolute hedge for systematic events. Profit is limited in a severe market downturn
- Risks
 - Max loss is the cost of the spread

Buying Downside NQX Put Spreads



Thank You!

**Looking for more on NDX Options?
We're here for you.**

Contact: sales@nasdaq.com